Arizona Transportation Research Center

NEWSLETTER
APRIL 2006

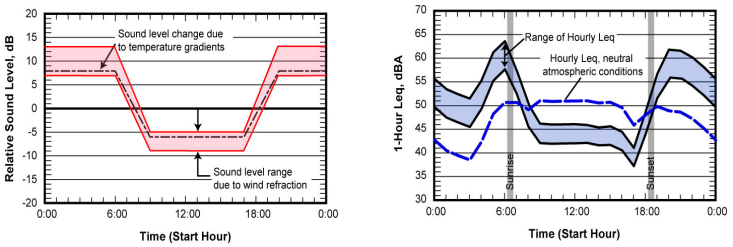
Project Updates
Highlights from selected projects

STATE PLANNING AND RESEARCH (SPR) PROJECTS

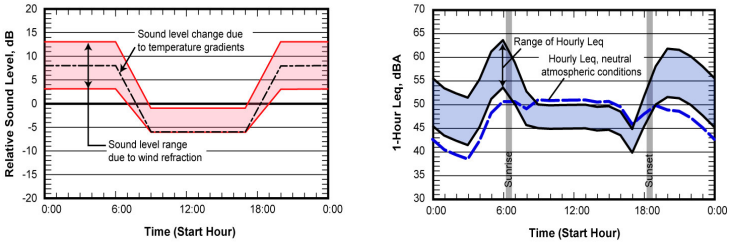
SPR-555, *Atmospheric Effects Associated with Highway Noise Propagation*

The prime motivation for this project was the observation that traffic noise from freeways in the Phoenix area was sometimes substantially higher than expected at distances of ¼ mile or farther from the roadway. It is evident that these higher than normal sound levels are caused by atmospheric conditions. The primary questions investigated in this project were: What are the atmospheric conditions in the Phoenix valley that contribute to higher than normal sound levels? Are the conditions unique to the Phoenix valley? Can the atmospheric effects be anticipated?

***A. Downwind* Location Under Late Night/Early Morning Down-Slope Flow, *Upwind* Under Daytime Up-Slope Flow**



***B. Upwind* Location Under Late Night/Early Morning Down-Slope Flow, *Downwind* Under Daytime Up-Slope Flow**



The study concluded that a variety of atmospheric conditions affect long distance sound propagation in the Phoenix area. The nighttime inversion condition that is common from October through March results in sound level increases averaging from 5 to 8 decibels (dB) at distances greater than ¼ mile from freeways. This is probably a year-round phenomenon since nighttime inversions occur in the warm weather months as well. The nighttime down-slope drainage flows off the mountain ranges surrounding the Phoenix valley cause localized focusing and de-focusing of sound levels. These can be consistent patterns over several days or can be isolated events occurring over periods of 15 to 20 minutes. These effects caused variations ranging from +4 to -10 dB. The highest sound levels during the October to March period were found to occur around sunrise when high traffic volumes coincide with strong inversion conditions. The loudest hour during the March and October measurements was consistently 6 a.m. The loudest hour is likely to shift with seasonal changes in sunrise and sunset.

The report is available on-line at: http://www.azdot.gov/TPD/ATRC/Publications/project_reports/index.asp. Select report number "555."

WASHTO-X Pooled Fund Project

The WASHTO-X Program is a pooled fund research study sponsored by Western Association of State Highway and Transportation Officials (WASHTO) state transportation departments. It provides state transportation departments and the associated field offices of the Federal Highway Administration the opportunity to conduct information exchanges among transportation personnel through Video-communications.

Upcoming sessions include *Safety Measures in School Zones: Speed Limits, Access Points, & School Routing Plans* on May 9, 2006 and *Product Evaluation Programs* on June 13, 2006. Arizona sessions are held in the Green Room of the Arizona Department of Transportation (ADOT) administration building at 206 S. 17th Avenue, Phoenix. Information on the agendas and registration for the sessions is available at: www.washto-x.org

ATRC Library

The mission of the ATRC Library is provide information services to all ADOT employees, transportation related information services to the faculty and staff of the universities and colleges in Arizona, and to the local Arizona transportation departments (city or county). Limited information services are provided to the public.

The ATRC Library has nearly 30,000 books, magazines, videos and CDs. The collection focuses on transportation planning and engineering. Most of the collection is reports published by federal and state transportation agencies. It also has professional society and commercial publications. The Library can also borrow material from other libraries through interlibrary loans.

On request, the Library will compile bibliographies on work-related issues for ADOT staff. The Library uses various bibliographic databases—some free, some that charge—to find citations relevant to the research question. These databases include the Transportation Research Information Services (TRIS), the National Technical Information Service (NTIS), and the University of California Library catalog (Melvyl), all of which are free, and the Online Computer Library Center (OCLC), which charges.

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MISSION: The ATRC mission is to pursue and share knowledge in transportation systems and programs.